

SCAT for Inland Oil Spills:

Shoreline Cleanup Assessment Technique: SCAT Process Part 1



Shoreline Assessment

Roles and Responsibilities
Overview of the Process
Activities under Each Step
Terminology and Forms



SCAT Responsibilities

- ① Conduct shoreline assessment surveys (generate data on shoreline types, lengths, and oiling conditions)
- ① Identify sensitive resources (ecological, recreational, cultural)
- ① Determine the need for treatment
- ① Recommend shoreline treatment methods (do's and don't)
- ① Recommend treatment priorities
- ① Monitor treatment effectiveness and effects

SCAT Data Should Answer the Following Questions:

- ⦿ Is treatment necessary at this site?
- ⦿ What treatment methods are appropriate or recommended?
- ⦿ What constraints are needed to protect sensitive resources?
- ⦿ What is the priority for treatment at this site?



SCAT Team Members

Agency Reps

- Federal On-Scene Coordinator rep
- State On-Scene Coordinator rep
- Responsible Party rep
- *Land Managers when surveying Fed or State Lands*
- *Landowner rep*

Others Skills as needed

- Safety
- Archaeologist
- Operations
- Local resource experts



SCAT Coordinator

(on small spills, this will be done by SCAT Team Leader)

- Manages all things related to SCAT Teams
- Participates in developing Cleanup Endpoints and Treatment Methods
- Participates in Planning Section meetings
- Participates in the Prep for Tactics and Tactics meetings
- Prepares Shoreline Treatment Recommendations (STRs)
- Briefs EU and Operations on issues related to shoreline treatment operations effectiveness and effects
- Data QA and oversight of all SCAT products
- Resolution of conflicts among stakeholders



SCAT Team Roles: Team Leader

- Should be the most experienced person in SCAT*
- Responsible for management of the team
- Completes the forms and sketches in the field
- Guides the team toward consensus on cleanup recommendations, priorities, special constraints, and notes dissenting opinions
- Briefs the SCAT Coordinator, Planning, and Operations staff, as needed
- Acts as the team Safety Officer





SCAT Team Roles: Agency Representatives

- Assist in data collection on shoreline types, oiling conditions, and special considerations
- Provides expertise in resource sensitivity and priorities
- Recommends site-specific constraints or precautions to be followed during cleanup
- Makes recommendations on cleanup methods and priorities
- Monitors effectiveness of cleanup operations



SCAT Team Roles: Operations Representative

- Evaluate appropriateness of cleanup techniques
- Identify logistical constraints and solutions
- Assist in data collection on oiling conditions
- Estimate the level of effort needed for cleanup

This role can be taken by one of the team members





SCAT Team Roles:

Data Manager

- Creates base maps with segments, sensitive areas, etc. for SCAT teams to use in recording data
- Conducts QA of daily SCAT forms
- Downloads the team's track line to generate maps for the team to delineate segments, zones, treatment areas, pits, etc.
- Downloads and geo-references SCAT team photographs
- Enters or supervises the entry of daily SCAT data
- Generates daily summary reports of shoreline cleanup status, maps of shoreline cleanup status, and specific data summaries requested by the UC

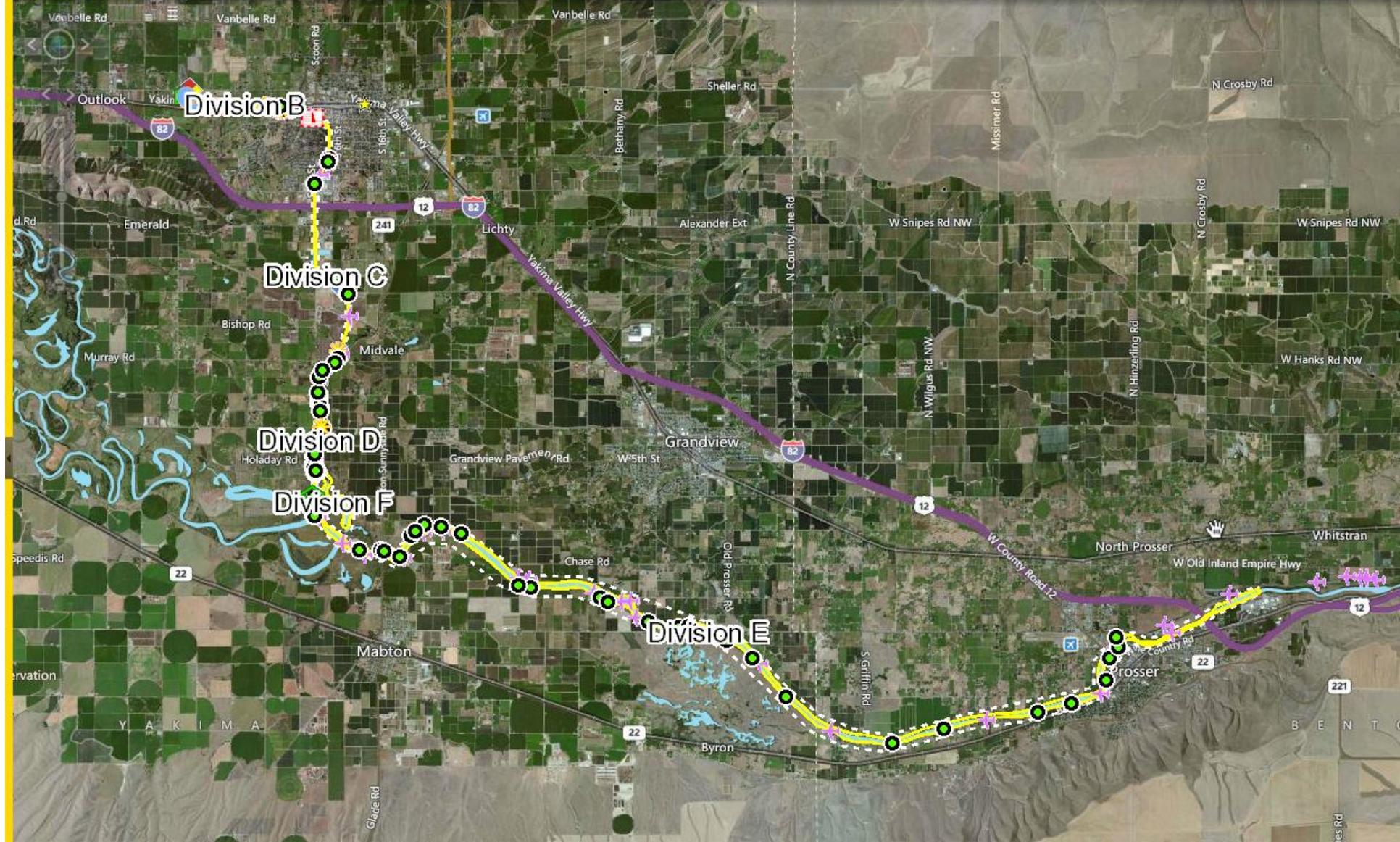


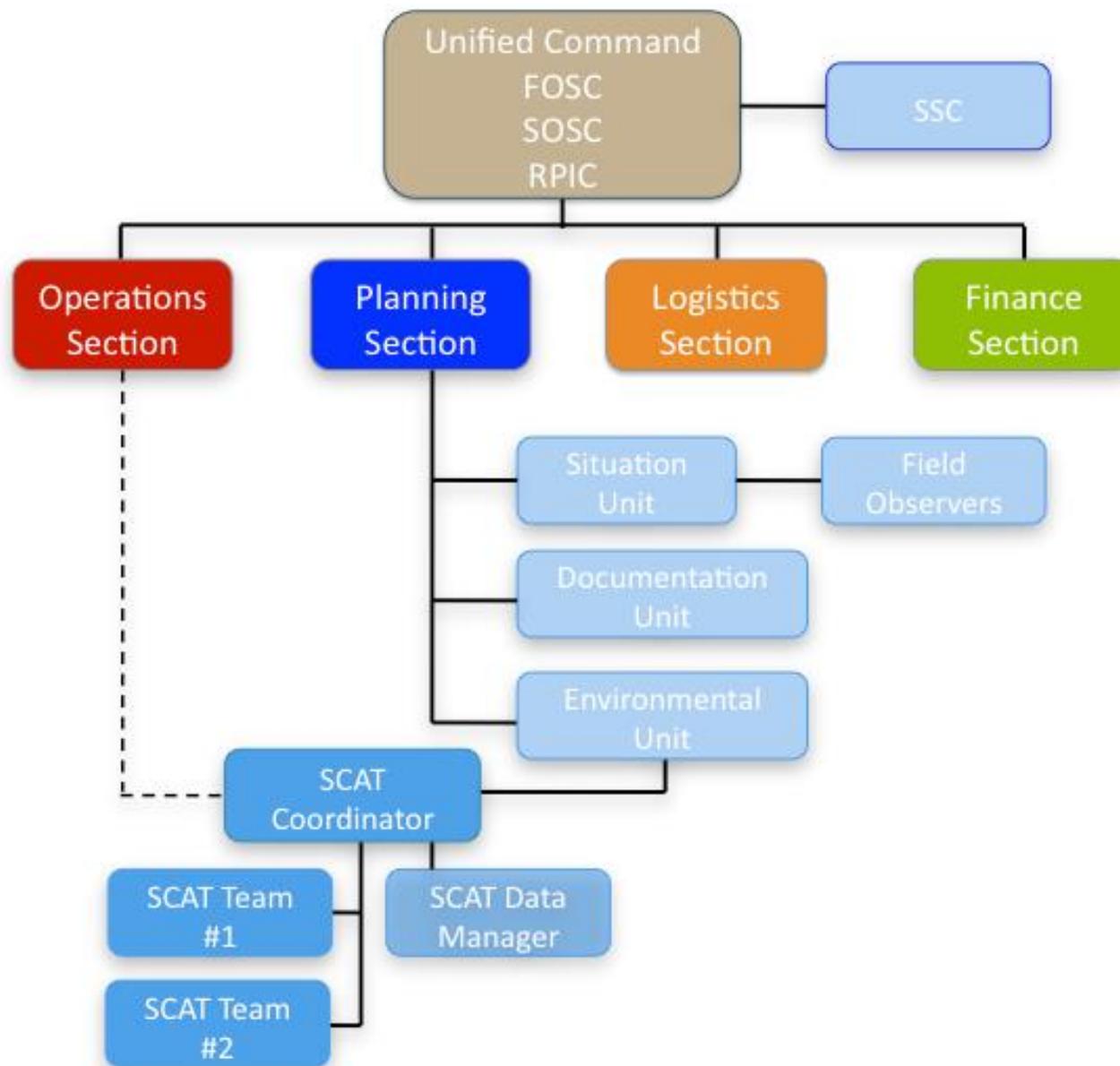
Sulphur Creek Oil Spill

EPA Region X

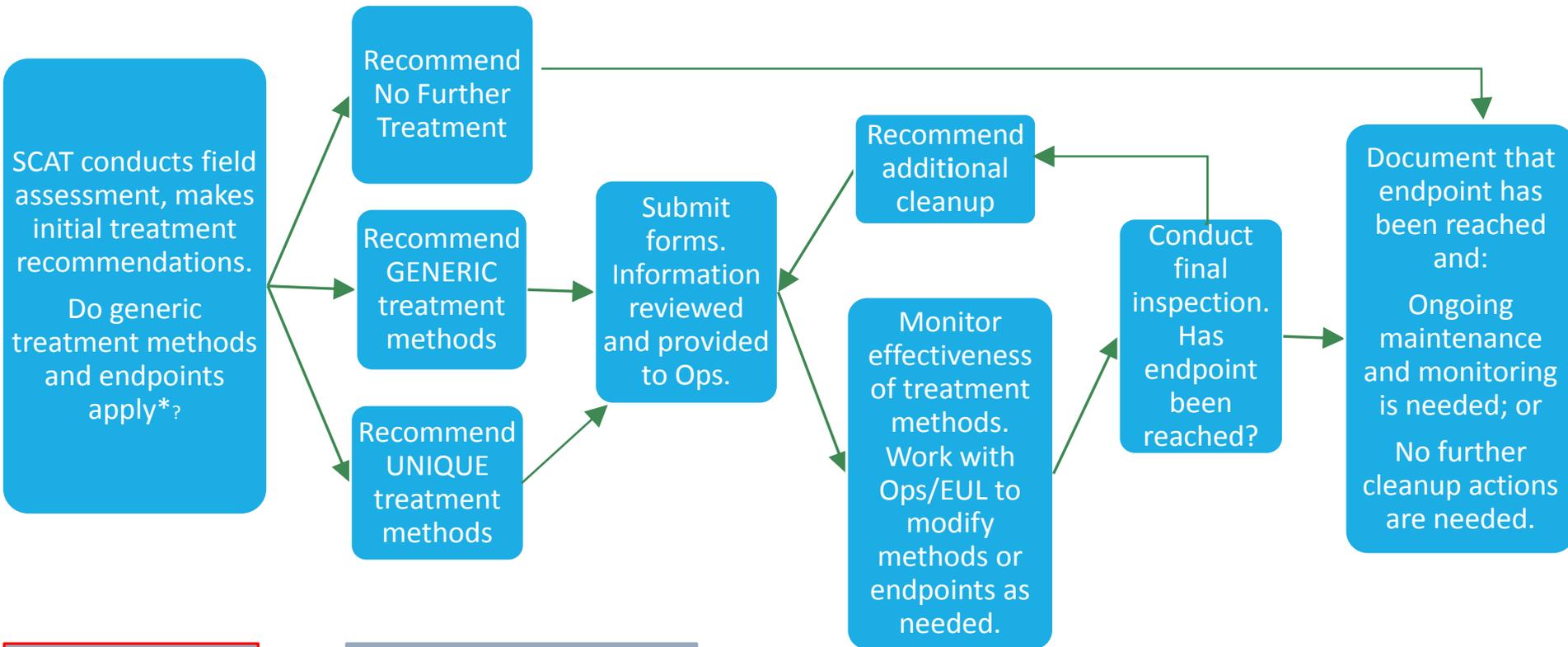


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SCAT TEAM ACTIONS



Shoreline Oiling Summary (SOS) for Assessment

Shoreline Treatment Recommendation (STR)

Shoreline Inspection Report (SIR)



* Generic Treatments and Endpoints provided in SCAT Workplan.



SCAT Activities

1. Reconnaissance survey
2. Segmenting the shoreline
3. Developing spill-specific cleanup guidelines and endpoints
4. Pre-survey planning and team assignments
5. Shoreline surveys



SCAT ACTIVITIES

6. Generate shoreline treatment recommendations, tables, maps, etc.
7. Monitoring cleanup operations
8. Post-treatment inspections
9. Final sign-off of cleanup activities

SCAT Activity 1: Reconnaissance Survey



Objectives

Get an overall perspective on habitat types and degree of contamination

Determine the extent of oiling in the impacted areas

Identify logistical constraints for access for both SCAT and cleanup teams

SCAT Activity 1: Aerial Reconnaissance Survey

Methods

Fly entire impact area at 400-500 feet and 70-80 knots in helo or high-wing aircraft

Use aerial photographs or GPS to record:

- Flight path, including date and time
- General areas and degree of oiling
- References to photographs/video taken



Mt. Erie, IL pipeline spill

Aug. 10, 2008

Slope to bottomland forest

5,000 barrels crude oil

7.1 acres of oiled sloughs



SCAT Activity 1: Land Based Reconnaissance Survey

Methods

Access impacted area on foot or by ATV

Use geo -tagged photographs or GPS and photos to record:

- Potentially sensitive habitats
- General areas and degree of oiling
- Potential access points for removal operations



SCAT Activity 1: Water Based Reconnaissance Survey

Methods

Access impacted area from water side via john or air boats

Use geo -tagged photographs or GPS and photos to record:

- Potentially sensitive habitats
- General areas and degree of oiling
- Potential access points for removal operations

Will require periodic stepping onto shoreline



Sommerville Diesel Spill

Recon Case Study

1000 gallons of diesel from AST

Impacted Town Creek

Potential of 3 miles creek impacted

OSC requested SCAT Team to recon



Recon Photos



Recon Photos



Recon Photos

Location 1718



Report Descriptions

Location: 1718

Priority: **Highest**

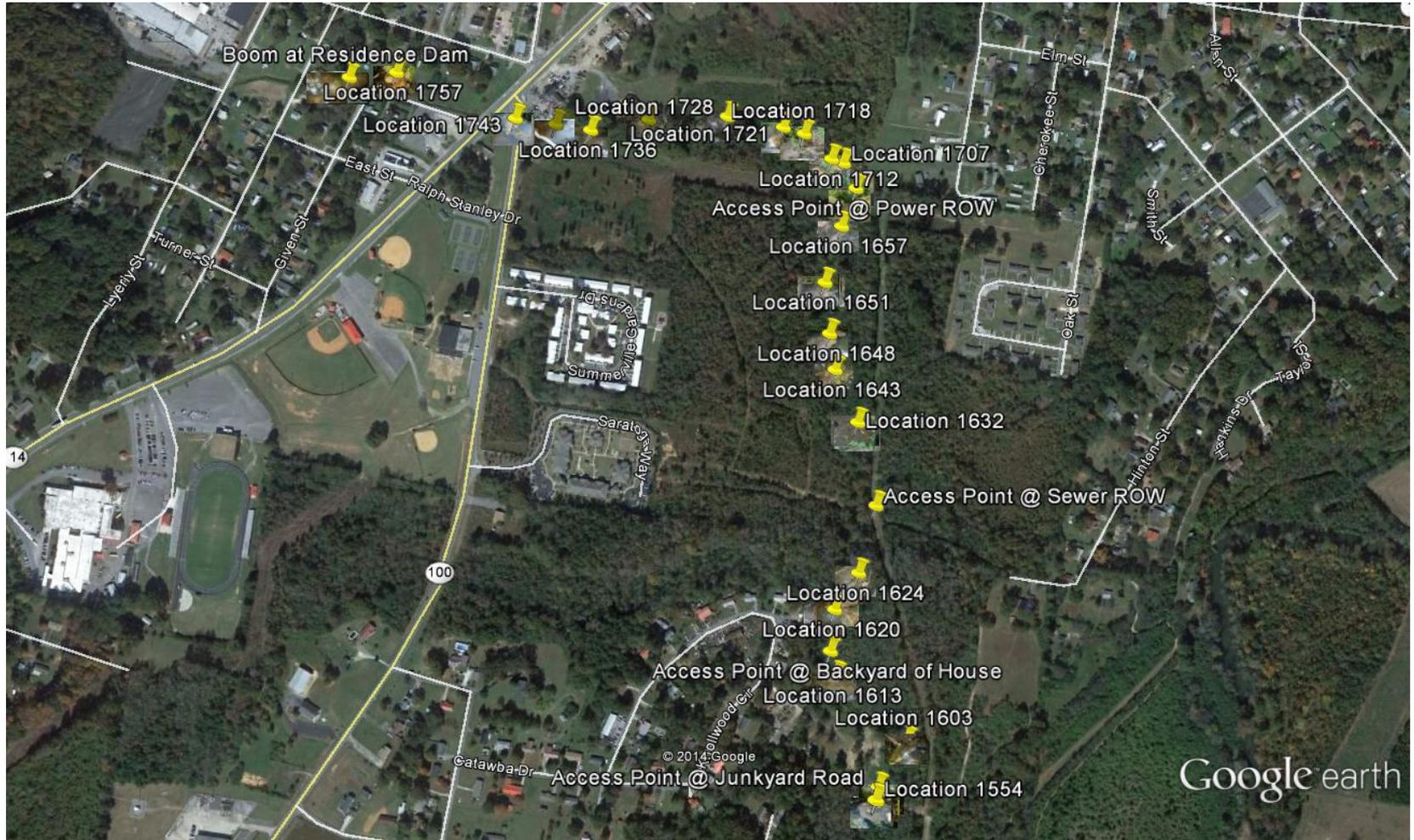
Access: Difficult

Notes: Dammed water surface with logs and brush collected oil and mousse in area in excess of 10ft x 20ft. Access in excess of 300ft upstream from power ROW.

Photos: DSCN2705, DSCN2706, DSCN2707, DSCN2709, DSCN2710



The Map



SCAT Activity 2: Segmentation

Objective

Divide habitat into units, called segments, for recording and tracking survey data, Operations activity, and final sign off



SCAT Activity 2: Segmentation

Methods

Use appropriate map scales for consistent coverage

Mark segments based on habitat types and degree of oiling
(from recon surveys)

Coordinate with Ops on segment naming

Should include local staff familiar with area



SCAT Activity 2: Segmentation

Methods (cont.)

Segment boundaries should be readily recognizable in the field

Size appropriate to spill conditions (0.2-2 km)

Pre-number segments with alphanumeric code







Example of Complex SCAT Segments



SCAT Activity 3: Cleanup Endpoints

Objectives

- Drives Shoreline Treatment Recommendations
- Provide Operations with environmental and safety constraints for cleanup in specific habitats
- Identify resource-specific constraints
- Develop endpoints appropriate for the habitat and its use



SCAT Activity 3: Cleanup Endpoints

- No detectable oil
- No visible oil
- No longer generates sheen
- No longer rubs off on contact
- Removal only if it causes no more harm than natural attenuation
- No further treatment recommended



SCAT Activity 4: Pre-survey Planning and Team Assignments

Objectives

Determine where to survey, logistics, and team assignments



SCAT Activity 4: Pre-survey Planning and Team Assignments

Methods

Revise the SCAT codes and forms if needed to fit spill conditions

Form teams with appropriate membership

Assign survey areas (primary and backup) for each team, based on priorities, logistics, local expertise, and ownership

Distribute segment maps for primary and backup areas; base sketch maps if available



SCAT Activity 4: Pre-survey Planning and Team Assignments

Methods (cont.)

Distribute field equipment (see checklist in the Shoreline Assessment Manual)

Brief team on survey objectives, logistics, and safety issues

Identify team roles

Discuss cleanup options and criteria for priorities



SCAT Activity 5: Shoreline Surveys

Objectives

Collect data on habitat types, oiling conditions,
ecological/human-use resources

Reach agreement on cleanup recommendations



SCAT Activity 5: Shoreline Surveys

Methods

Confirm segment boundaries

Using standard terms and codes to describe:

- Habitat characteristics
- Surface oil conditions
- Subsurface oil conditions
- Special considerations (ecological, recreational, cultural)



SCAT Activity 5: Shoreline Surveys

Methods (cont.)

Sketch the segment/delineate zones on a map, focusing on the oil and special considerations

Log and locate all photographs taken

Discuss and agree upon cleanup recommendations and priorities



Customize SCAT Terminology to Support Operations!!!

High Priority for Removal

Thick Oil/Mobil Oil

High Public Need

High Recreational Use

High Biological Sensitivity



General Information on the Segment

River SOS

SAM, pg D-8

RIVER BANK SHORELINE OIL SUMMARY (SOS) FORM: _____ Spill _____ Page _____ of _____

1. GENERAL INFORMATION		Date (dd/Month/yyyy)	Time (24h standard/daylight) _____ : _____ to _____ : _____	Water Level Low / Mean / Bankfull / Overbank Falling / Steady / Rising	
Segment ID:	Bank: L / R	Segment Name:			
Survey By: Foot ___ ATV ___ Boat ___ Helicopter ___ Other _____			Weather: Sun / Clouds / Fog / Rain / Snow / Windy / Calm		
2. SURVEY TEAM	Name	Organization	Name	Organization	
Team Number					
3. SEGMENT		Total Length: _____ meters	Length Surveyed: _____ meters	Datum: _____	
Survey Start GPS:	WP: _____	LAT: _____	LONG: _____		
Survey End GPS:	WP: _____	LAT: _____	LONG: _____		
4a. RIVER BANK TYPE: <i>Indicate only ONE Primary (dominant) type and ALL Secondary types. CIRCLE those OILED</i>					
BEDROCK: Cliff ___ Ramp ___ Shelf ___		UNCONSOLIDATED: Clay ___ Mud ___ Sand ___ Mixed Fine ___ Shell ___ Mixed Coarse ___			
MAN-MADE: Solid ___ Permeable ___		Pebble-Cobble ___ Boulder ___ Rubble ___ Marsh/Swamp ___ Peat/Organics ___ Wooded ___			
Description: _____		Vegetated ___			
ESI Shoreline Type (primary) _____ (secondary) _____		Other: _____			
4b. OVERBANK / BACKSHORE TYPE: <i>Indicate only ONE Primary (P) and ANY Secondary (S) types.</i>					
Cliff/Bluff: _____ ht. _____ m.	Flat/Lowland/Field _____	Dune _____	Inlet/Channel _____	Delta _____	Lagoon _____ Marsh/Wetland _____
Sloped: > (5°) (15°) (30°)	Man-Made: _____	Other: _____		Wooded / Vegetated? _____	
4c. RIVER VALLEY CHARACTER: <i>Circle or select as appropriate.</i>					
Channel Width: <10 m	10-100 m	>100 m estimate _____ m	Shoal(s) Present: Y/N	Point Bar Present: Y/N	
Water Depth: >1 m	1-5 m	>5 m estimate _____ m	Bar-Shoal substrate: silt/sand/mixed/cobble/boulder/bedrock/debris		
CHANNEL FORM: Cascade ___ Rapids ___ Pool ___ Riffle ___ Glide ___ Jam ___ Other: _____					
RIVER FORM: Straight ___ Meander ___ Anastamosed ___ Braided ___ Other: _____					
VALLEY FORM: Canyon ___ Confined or Leveed Channel ___ Flood Plain Valley ___ Other: _____					
5. OPERATIONAL FEATURES		Oiled Debris? Yes / No	Type: _____	Amount: _____ (bags/trucks)	
Direct backshore access? Yes / No	Alongshore access from next segment? Yes / No		Suitable for backshore staging? Yes / No		
Access Description / Restrictions: _____				Current Dominated Channel? Yes/No	

6. OILING DESCRIPTION: Indicate 100% overlapping zones in different tidal zones by numbering them (e.g. A1, A2)

Zone ID	WP # Start	WP # End	Substrate Type(s) Or ESI Code	River Bank Zone				Oil Cover						Oil Thickness					Oil Character					
								Area		Distribution		Size												
				MS	LB	UB	OB	Length (m)	Width (m)	Distr. % (>1) <input type="checkbox"/>	Number per unit area	Avg Size (cm)	Large Size (cm)	TO	CV	CT	ST	FL	FR	MS	TB	PT	TC	SR

7. SUBSURFACE OILING CONDITIONS: Format: Indicate Zone ID in Pit #, e.g., A-1, B-2, B-3, (use only number if not in zone, e.g., 4, 5)

Pit #	WP	Substrate Type Surface/Subsurface	River Bank Zone				Pit Depth (cm)	Oiled Interval (cm-cm)	Subsurface Oil Character							Water Table (cm)	Sheen Color B,R,S,N	Clean Below Yes / No	
			MS	LB	UB	OB			AP	OP	PP	OR	OF	TR	NO				%
		/						-											
		/						-											
		/						-											
		/						-											

8. COMMENTS: Cleanup Recommendations; Ecological/Recreational/Cultural Issues; Wildlife Observations; Oiling Descriptions

Sketch / Map: Yes / No Photos/Video: Yes / No Numbers: (-) Photographer Name:

Stream SOS

SAM, pg D-10

6-L. LEFT BANK (facing downstream) SURFACE OILING DESCRIPTION *Indicate 100% overlapping oil zones by numbering them (e.g. L-A1, L-A2).*

Zone ID	WP # Start	WP # End	Substrate Type(s) or ESI Code	Stream Bank Zone				Oil Cover						Oil Thickness					Oil Character						
								Area		Distribution		Size													
				MS	LB	UB	OB	Length (m)	Width (m)	Distr. % (>1)	Number per unit area	Avg Size (cm)	Large Size (cm)	TO	CV	CT	ST	FL	FR	MS	TB	PT	TC	SR	AP

6-R. RIGHT BANK (facing downstream) SURFACE OILING CONDITIONS: *Indicate 100% overlapping oil zones by numbering them (e.g. R-A1, R-A2).*

Zone ID	WP # Start	WP # End	Substrate Type(s) or ESI Code	River Bank Zone				Oil Cover						Oil Thickness					Oil Character							
								Area		Distribution		Size														
				MS	LB	UB	OB	Length (m)	Width (m)	Distr. % (>1)	Number per unit area	Avg Size (cm)	Large Size (cm)	TO	CV	CT	ST	FL	FR	MS	TB	PT	TC	SR	AP	No

7. COMMENTS: *Cleanup Recommendations; Ecological/Recreational/Cultural Issues; Wildlife Observations; Oiling Descriptions*

General Information on the Segment

SOS

SAM, pg D-8

SHORELINE OIL SUMMARY (SOS) FORM: _____ Spill _____ Page ____ of ____

1. GENERAL INFORMATION		Date (dd/Month/yyyy) (please use month name)	Time (24h standard/daylight) (00:00 to 00:00) ____:____ to ____:____	Tide Height L / M / H Rising / Falling
Segment ID:				
Segment Name:				
Survey By: Foot /ATV/ Boat / Helicopter / Overlook / Other _____			Weather: Sun / Clouds / Fog / Rain / Snow / Windy / Calm	
2. SURVEY TEAM	Name	Organization	Name	Organization
Team Number				
3. SEGMENT	Total Length:	m	Length Surveyed:	m
				Datum: WGS84
Survey Start GPS:	WP:	LAT:	LONG:	
Survey End GPS:	WP:	LAT:	LONG:	
4a. BACKSHORE CHARACTER: Indicate only ONE Primary type and ALL Secondary types				
Cliff/Slope ___ Lowland ___ Beach ___ Dune ___ Wetland ___ Lagoon ___ Delta ___ Channel ___ Man-Made ___:				
4b. ESI SHORELINE TYPE: Indicate only ONE Primary (P) and ANY Secondary (S) types. CIRCLE those oiled.				
Primary:		Secondary:		
5. OPERATIONAL FEATURES	Oiled Debris? Yes / No	Type:	Amount: (bags)	
Direct backshore access? Yes / No	Alongshore access from next segment? Yes / No		Suitable for backshore staging? Yes / No	
Access Description / Restrictions:				

6. OILING DESCRIPTION: Indicate overlapping zones in different tidal zones by numbering them (e.g. A1, A2)

Zone ID	ESI Type	WP Start	WP End	Tidal Zone				Oil Cover				Oil Thickness					Oil Character							
								Area		Distribution														Size
				LI	MI	UI	SU	Length (m)	Width (m)	Distr % >1	# per unit area	Avg Size (cm)	Large Size (cm)	TO	CV	CT	ST	FL	FR	MS	TB	PT	TC	SR

7. SUBSURFACE OILING CONDITIONS: Format: Zone ID dash Trench Number in that Zone, e.g., "A-1, B-1, B-2"

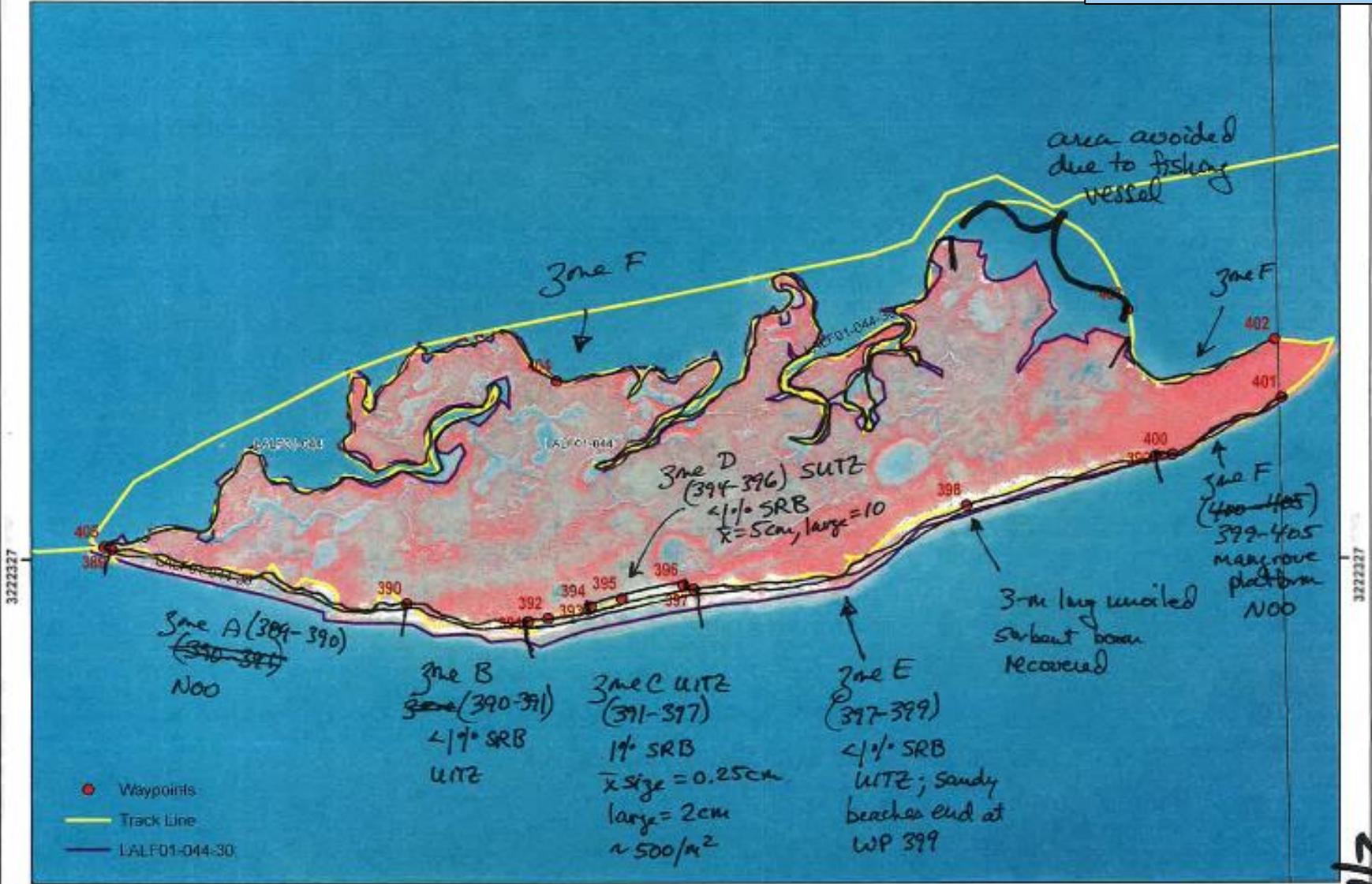
Pit #	WP	Substrate Type Surface / Subsurface	Tidal Zone				Pit Depth (cm)	Oiled Interval (cm-cm)	Subsurface Oil Character								Water Table (cm)	Sheen Color B,R,S,N	Clean Below Yes / No							
			LI	MI	UI	SU			OP	PP	OR	OF	TR	TB	SR	AP				NO	%					

8. COMMENTS: Cleanup Recommendations; Ecological/Recreational/Cultural Issues; Wildlife Observations; Oiling Descriptions

The original
creator of
SCAT forms

present job





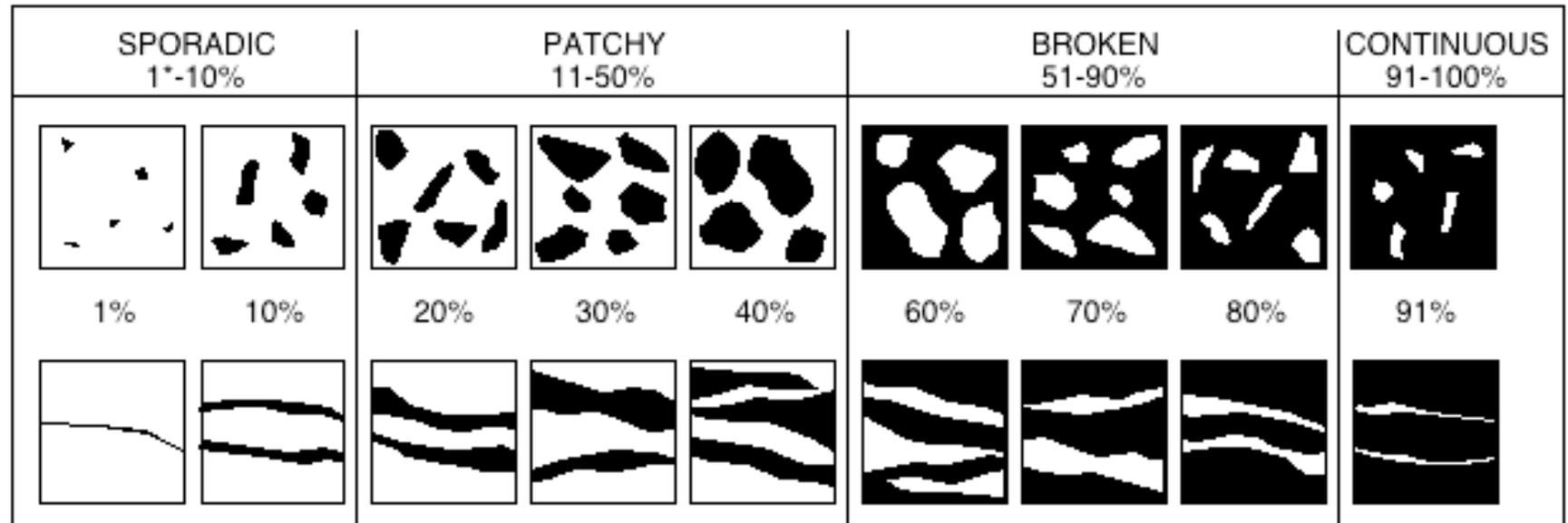
Rapid Assessment Survey | Lafourche Parish | Calumet Island | 23 September 2012



2/10



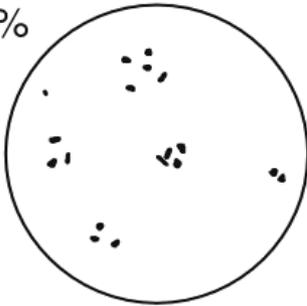
OIL COVER ESTIMATION CHART



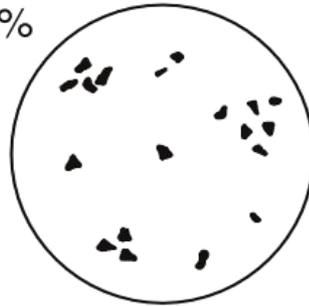
*TRACE = <1%

Comparison Chart for Visual Percent Cover Estimation

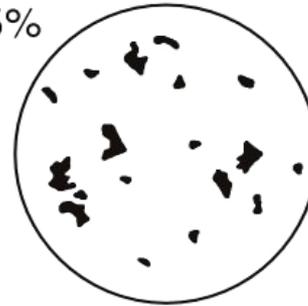
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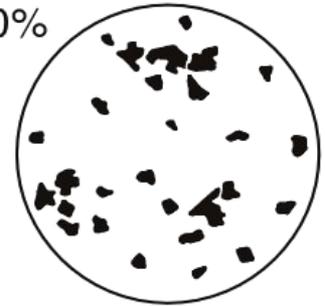
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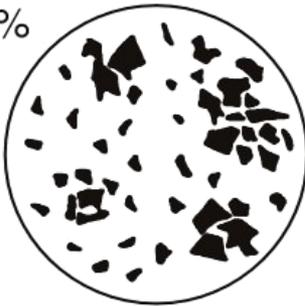
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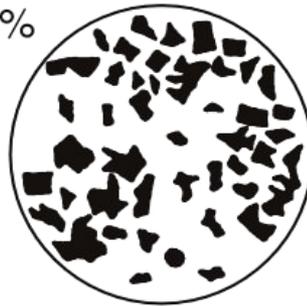
10%



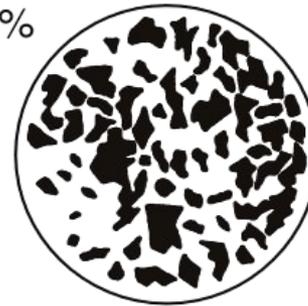
20%



30%



40%



50%



SCAT Terminology

Surface Oil Distribution

C	Continuous	91-100% cover
B	Broken	51-90%
P	Patchy	11-50%
S	Sporadic	<1-10%
T	Trace	<1%

C

Continuous (91-100% Cover)



B

Broken (51-90% cover)



P

Patchy (11-50% cover)





Sporadic (1-10% cover)



SCAT Terminology

Surface Oiling Descriptor – THICKNESS

- PO** Pooled/Thick Oil (fresh oil or mousse > 1 cm)
- CV** Cover (oil or mousse >0.1 cm to <1 cm on any surface)
- CT** Coat (visible oil <0.1 cm, can be scraped off with fingernail)
- ST** Stain (visible oil, cannot be scraped off with fingernail)
- FL** Film (transparent or iridescent sheen or oily film)



Pooled /Thick Oil

Fresh or emulsified oil > 1cm thick





Cover

Fresh or emulsified oil 0.1 - 1.0 cm thick





Coat

Visible oil < 0.1cm can be scraped off with fingernail





Stain

Visible oil that cannot be scraped off with fingernail





Film

Transparent or iridescent sheen or oily film



Bacterial Films – Not Oil Sheen!

Test: Break the film into pieces.

If edges are ragged and stay broken = Natural

If edges are swirly and the pieces come back together = Oil sheen



SCAT Terminology

Surface Oiling Descriptors - TYPE

- FR** Fresh Oil (unweathered, liquid oil)
- MS** Mousse (emulsified oil occurring over broad areas)
- TB** Tarballs (discrete accumulations of oil <10 cm in diameter)
- TC** Tar (highly weathered oil, of tarry, nearly solid consistency)



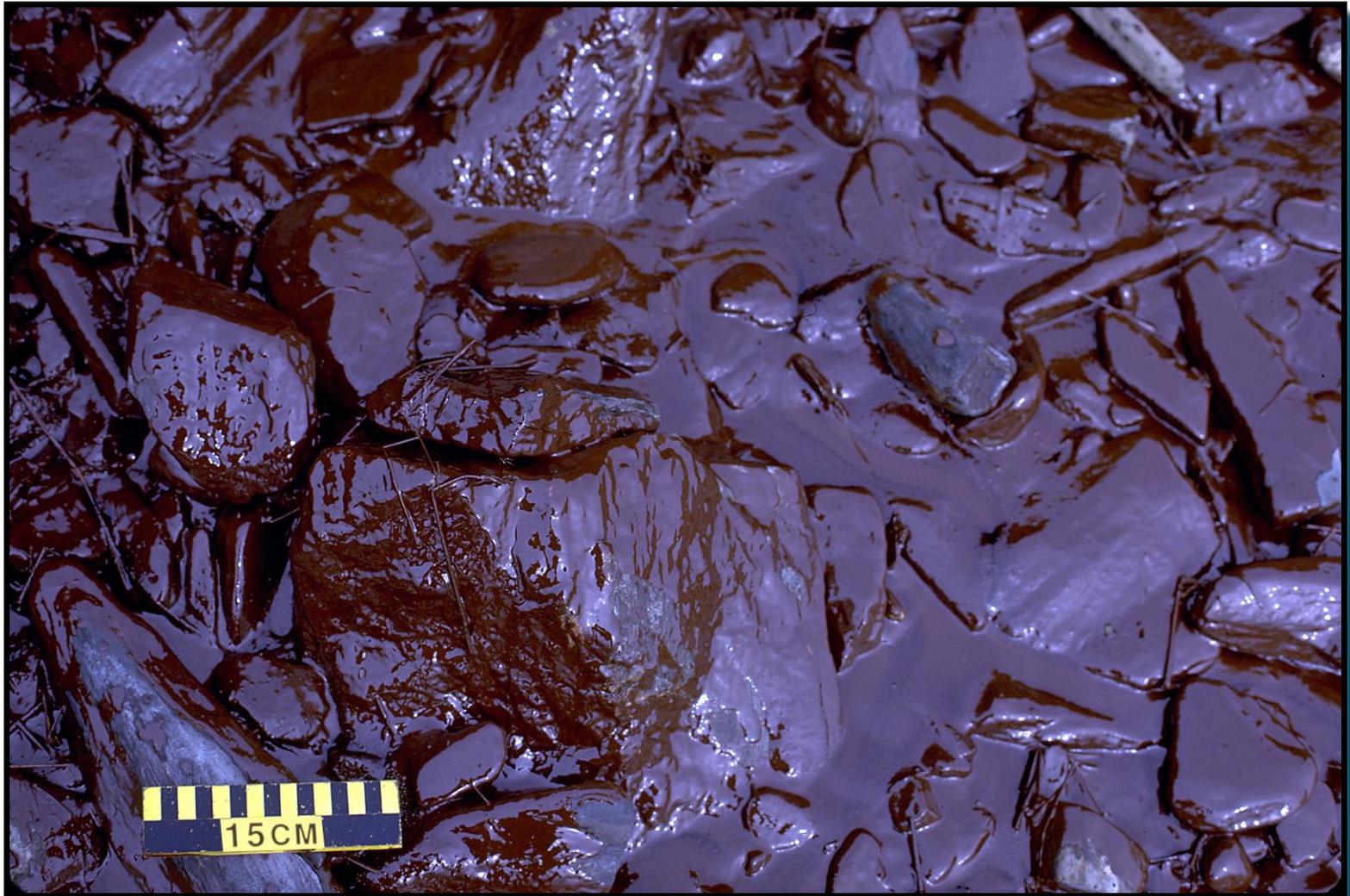
Fresh Oil
Unweathered liquid oil





Mousse

Emulsified oil





Tar Balls

Discrete accumulations of oil < 10 cm in diameter





Patties

Discrete accumulations of oil > 10 cm in diameter





Tar

Highly weathered oil of nearly solid consistency



SCAT Terminology

Surface Oiling Descriptors - TYPE

- SR** Surface Oil Residue (non-cohesive, oiled surface sediments)
- AP** Asphalt Pavements (cohesive, heavily oiled surface sediments)
- NO** No oil (no evidence of any type of oil)



Surface Oil Residue

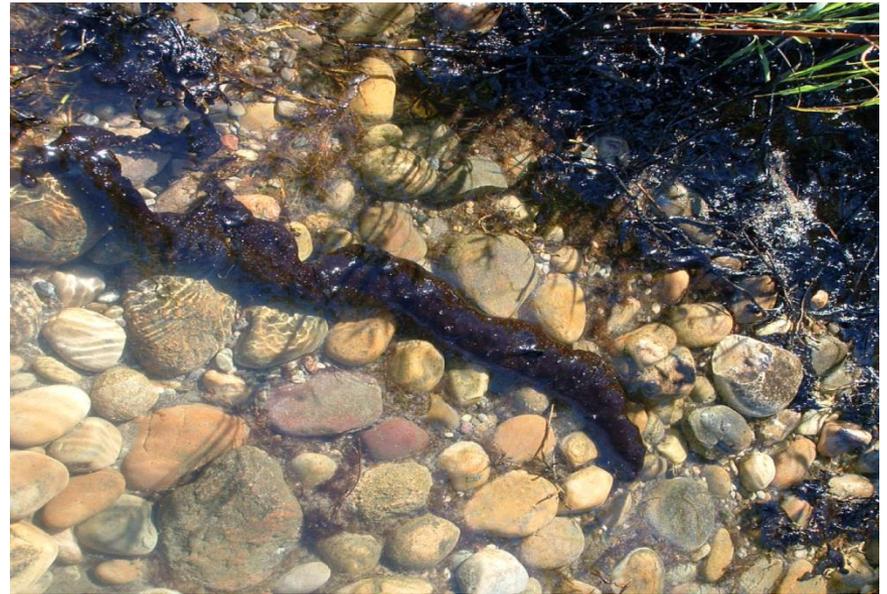
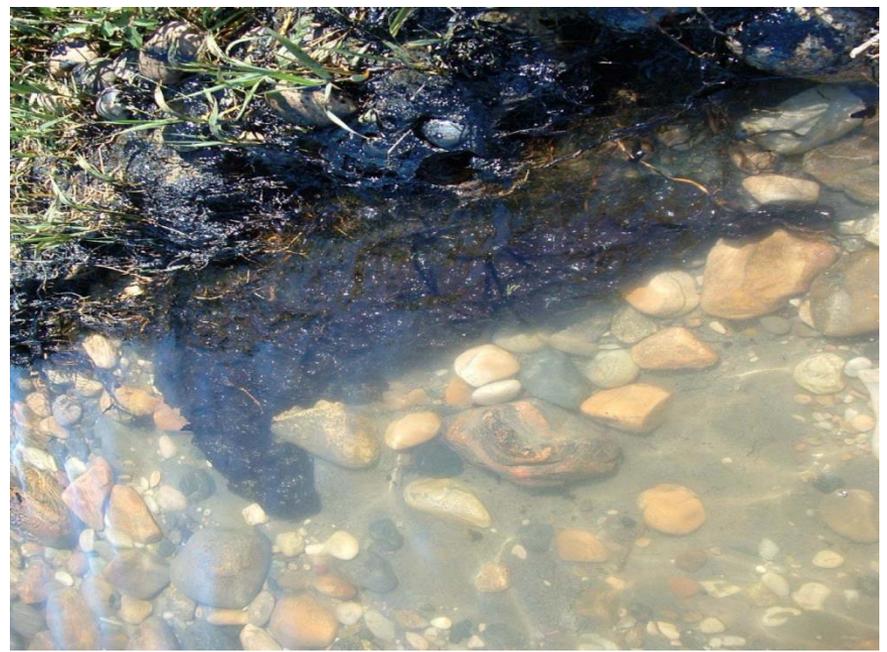
Non-cohesive, heavily oiled surface sediments



Mat and “Logs”

Lake Wabamun,
Canada

Revise the SCAT terms
as needed for unique
conditions!





Asphalt Pavement

Cohesive, heavily oiled surface sediments



SCAT Terminology

Subsurface Oiling Descriptors - TYPE

- OP Oil-Filled Pores (pore spaces completely filled with oil)
- PP Partially Filled Pores (oil does not flow out of the sediments when disturbed)
- OR Oil Residue (sediments are visibly oiled with black/brown coat or cover on the clasts, but little or no accumulation of oil within the pore spaces)



Oil-Filled Pores

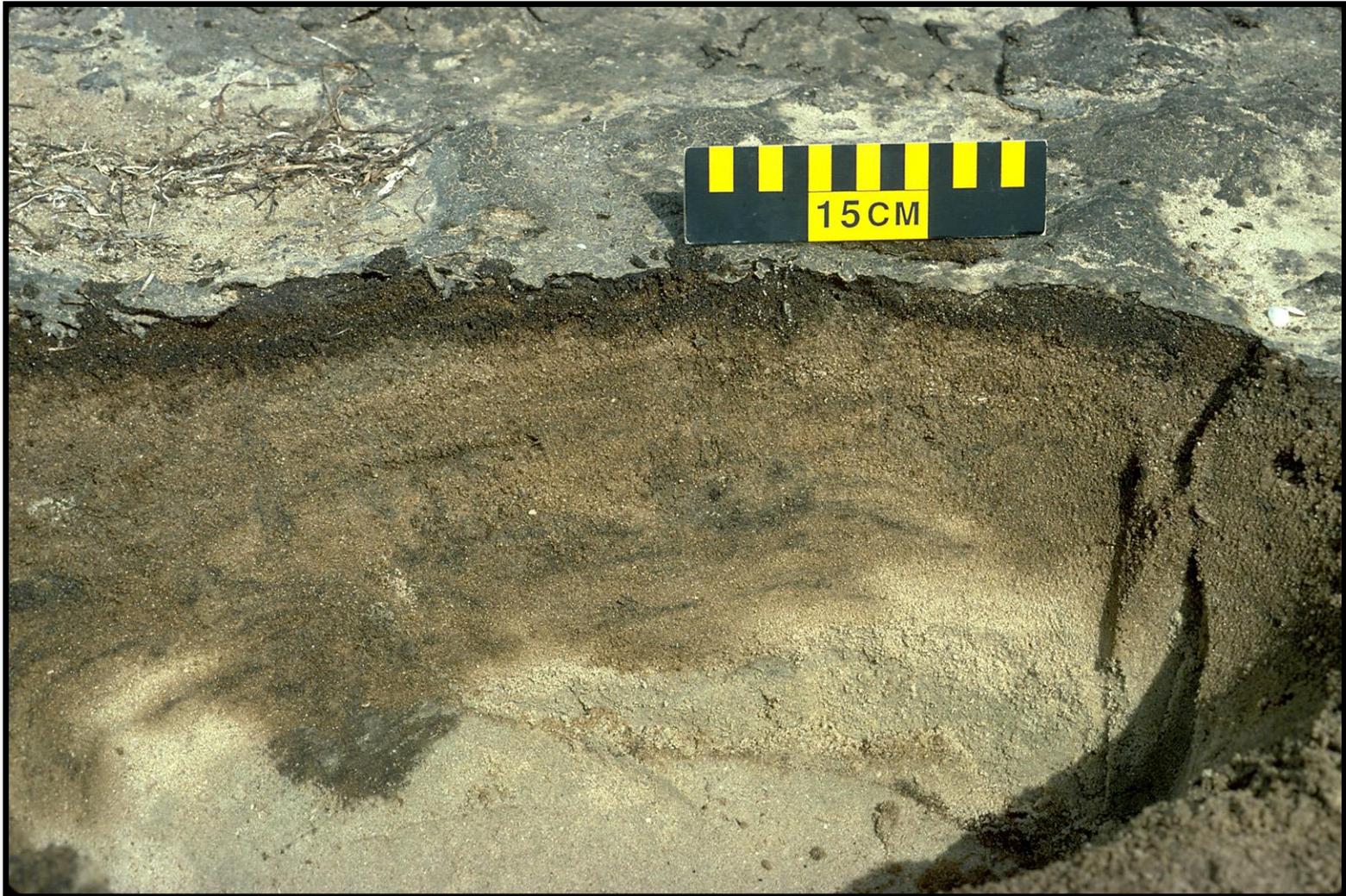
Pore spaces filled with liquid oil that flows out





Oil Residue

Sediments visibly coated but no free oil in pore spaces



SCAT Terminology

Subsurface Oiling Descriptors – TYPE

- OF Oil Film (sediments are lightly oiled with an oil film, or stain on the clasts)
- TR Trace (discontinuous film or spots of oil, or an odor or tackiness)

OF

Oil-Film

Sediments are lightly oiled with an oil sheen or stain



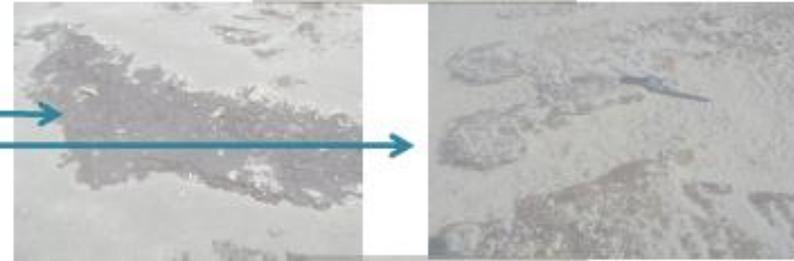
Macondo Spill Sandy Beach Surface Oil Terms

Surface Oil Categories - Sandy Beaches – Macondo Spill

SOP Small Oil Particles
mousse drops, sticky, classified in TB as SOP if less than 10cm – if greater classified as Mousse (MS)



SR Surface Residue
Non-cohesive, oiled surface sediments up to 5cm deep, soft/crumbly,
Sediments may contain some oil filled/partially filled pore spaces and have some liquid consistency but majority is sand saturated with oil
May or may not be partially buried



SRB/SRP Surface Oil Residue Ball/Patty
Discreet, non-cohesive, sand saturated oiled sediments in a ball (<10cm) or patty (10cm-1m) – may be SOP with sand that has become incorporated by wind or waves or may have broken off zones of SR



MS Mousse
Emulsified oil with rusty orange to dark brown colour, liquid consistency
may sink into sand, saturating and then becoming SR



SCAT-OPS JOB AID

Sub Surface Oil Character

AP	Asphalt pavement, cohesive mixture weathered oil and sediment
OP	Oil filled pores, pore spaces are completely filled with oil, oil flows out when disturbed
PP	Partially filled pores, pore spaces filled with oil but generally does not flow out when disturbed
OR	Cover ($\geq 0.1 - 1$ cm) or Coat ($> 0.01m - 0.1cm$) of oil residue on sediments and/or some pore spaces partially filled with oil – surface oil residue balls (SRB)
OF	Stain ($\leq 0.01cm$) or film oil residue on sediment surfaces, non-cohesive
TR	Trace, discontinuous film or spots of oil on sediments, or an odour/tackiness with no visible evidence of oil
NO	No Oil



SCAT Form Exercise

You will fill out a form here in the class, based on a field basemap and photographs



Kentucky River Spill

26 January 2005

Mid-Valley Pipeline release of 63,000 gal of light crude oil into the Kentucky River

Due to steepness of the river bank, all SCAT surveys conducted by boat



Segment C-L-04
30 Jan 2005
SCAT Team 1

© 2014 Google

©2010 Google

917 m

Imagery Date: 9/23/2013

38° 37.577' N 85° 5.938' W elev 134 m

Eye alt 4.36 km



1. GENERAL INFORMATION		Date (dd/Month/yyyy) <u>30 JAN 2005</u>	Time (24h standard/daylight) <u>09 : 30</u> to <u>11 : 30</u>	Water Level Low / <u>Mean</u> / Bankfull / Overbank Falling / Steady / Rising
Segment ID: <u>C-L-04</u>	Bank: <u>L</u> / R	Segment Name:		

Survey By: Foot ___ ATV ___ Boat Helicopter ___ Other ___ Weather: Sun / Clouds / Fog / Rain / Snow / Windy / Calm

2. SURVEY TEAM	Name	Organization	Name	Organization
Team Number <u>1</u>	<u>B. SMITH</u>	<u>EPA</u>	<u>M. WHITE</u>	<u>MVP</u>
	<u>T. JONES</u>	<u>KDEQ</u>	<u>S. MILLER</u>	<u>Safety</u>
	<u>L. MOORE</u>	<u>USFWS</u>		

3. SEGMENT Total Length: _____ meters Length Surveyed: _____ meters Datum: _____

Survey Start GPS: WP: <u>112</u> LAT: <u>38 . 617659 N</u> LONG: <u>-85 . 087898</u>
Survey End GPS: WP: <u>118</u> LAT: <u>38 . 619728</u> LONG: <u>-85 . 09277</u>

4a. RIVER BANK TYPE: Indicate only ONE Primary (dominant) type and ALL Secondary types. CIRCLE those OILED

BEDROCK: Cliff ___ Ramp ___ Shelf ___	UNCONSOLIDATED: Clay ___ Mud ___ Sand ___ Mixed Fine <u>P</u> Shell ___ Mixed Coarse ___
MAN-MADE: Solid ___ Permeable ___	Pebble-Cobble ___ Boulder ___ Rubble ___ Marsh/Swamp ___ Peat/Organics ___ Wooded ___
Description: _____	Vegetated <u>S</u>
ESI Shoreline Type (primary) ___ (secondary) ___	Other: <u>ROOT BALLS</u>

4b. OVERBANK / BACKSHORE TYPE: Indicate only ONE Primary (P) and ANY Secondary (S) types.

Cliff/Bluff: ___ ht. 5 m. Flat/Lowland/Field ___ Dune ___ Inlet/Channel ___ Delta ___ Lagoon ___ Marsh/Wetland ___
 Sloped: > (5°) (15°) (30°) Man-Made: _____ Other: _____ Wooded / Vegetated? P

4c. RIVER VALLEY CHARACTER: Circle or select as appropriate.

Channel Width: <10 m 10-100 m >100 m estimate <u>80</u> m	Shoal(s) Present: <u>YN</u> Point Bar Present: <u>YN</u>
Water Depth: >1 m 1-5 m >5 m estimate <u>5</u> m	Bar-Shoal substrate: silt/sand/mixed/cobble/boulder/bedrock/debris
CHANNEL FORM: Cascade ___ Rapids ___ Pool <input checked="" type="checkbox"/> Riffle ___ Glide ___ Jam ___ Other: _____	
RIVER FORM: Straight ___ Meander <input checked="" type="checkbox"/> Anastomosed ___ Braided ___ Other: _____	
VALLEY FORM: Canyon ___ Confined or Leveed Channel <input checked="" type="checkbox"/> Flood Plain Valley ___ Other: _____	

5. OPERATIONAL FEATURES

Oiled Debris? (Yes) <u>No</u> Type: <u>SMALL WOODY</u> Amount: <u>100</u> (bags/trucks)
Direct backshore access? Yes <u>No</u> Alongshore access from next segment? Yes <u>No</u> Suitable for backshore staging? Yes <u>No</u>
Access Description / Restrictions: <u>STEEP, SLIPPERY BANK - ONLY WATER ACCESS</u> Current Dominated Channel? (Yes/No) <u>Yes</u>

Zone A: WP 112-114
100% CV 1,500 x 0.5 m



6. OILING DESCRIPTION: Indicate 100% overlapping zones in different tidal zones by numbering them (e.g. A1, A2)

Zone ID	WP # Start	WP # End	Substrate Type(s) Or ESI Code	River Bank Zone				Oil Cover						Oil Thickness					Oil Character							
				MS	LB	UB	OB	Area		Distribution		Size		TO	CV	CT	ST	FL	FR	MS	TB	PT	TC	SR	AP	No
								Length (m)	Width (m)	Distr. % (>1)	Number per unit area	Avg Size (cm)	Large Size (cm)													
A	112	114	MUD		✓			1,500	0.5	100							✓									
B	114	115	MUD		✓			8	1	100							✓									
C	115	118	MUD		✓			1,950	0.3	100							✓									
D	118	119	MUD		✓			900																	✓	

7. SUBSURFACE OILING CONDITIONS: Format: Indicate Zone ID in Pit #, e.g., A-1, B-2, B-3, (use only number if not in zone, e.g., 4, 5)

Pit #	WP	Substrate Type Surface/Subsurface	River Bank Zone				Pit Depth (cm)	Oiled Interval (cm-cm)	Subsurface Oil Character							Water Table (cm)	Sheen Color B,R,S,N	Clean Below Yes / No		
			MS	LB	UB	OB			AP	OP	PP	OR	OF	TR	NO				%	
A-1	113	M / M		✓			15	-								✓		-	-	-
C-1	117	M / M		✓			10	-								✓		-	-	-
		/						-												
		/						-												

8. COMMENTS: Cleanup Recommendations; Ecological/Recreational/Cultural Issues; Wildlife Observations; Oiling Descriptions

FLUSH - LOW PRESSURE FROM BOATS IN ZONES A & C - AVOID SEDIMENT EROSION.
 ZONE B - USE SORBENTS TO RECOVER FLOATING OIL IN ROOT BALLS THEN
 PUSH UNTIL NO FREE BLACK OIL MOBILIZED.

Sketch (Map) Yes / No Photos/Video Yes / No Numbers: (14 - 30) Photographer Name: SMITH

Zone B: WP 115-118
100% CT 1,950 x 0.3 m



1/30/2005 3:45pm

Segment C-L-04
30 Jan 2005
SCAT Team 1

Zone A:
WP 112-114
100% CT
1,500 x 0.5
m

Zone B:
WP 114-115
100% TO
8 x 1 m

Zone C:
WP 115-118
100% CT
1,950 x 0.3
m

Zone D:
WP 118-119
NOO 900 m

917 m

Imagery Date: 9/23/2013

© 2014 Google
38° 37.577' N 85° 5.938' W elev 134 m

© 2010 Google

Eye alt 4.36 km

6. OILING DESCRIPTION: Indicate 100% overlapping zones in different tidal zones by numbering them (e.g. A1, A2)

Zone ID	WP # Start	WP # End	Substrate Type(s) Or ESI Code	River Bank Zone				Oil Cover						Oil Thickness					Oil Character							
				MS	LB	UB	OB	Area		Distribution		Size		TO	CV	CT	ST	FL	FR	MS	TB	PT	TC	SR	AP	No
								Length (m)	Width (m)	Distr. % (>1)	Number per unit area	Avg Size (cm)	Large Size (cm)													
A	112	114	MUD		✓			1,500	0.5	100							✓									
B	114	115	MUD		✓			8	1	100							✓									
C	115	118	MUD		✓			1,950	0.3	100							✓									
D	118	119	MUD		✓			900																	✓	

7. SUBSURFACE OILING CONDITIONS: Format: Indicate Zone ID in Pit #, e.g., A-1, B-2, B-3, (use only number if not in zone, e.g., 4, 5)

Pit #	WP	Substrate Type Surface/Subsurface	River Bank Zone				Pit Depth (cm)	Oiled Interval (cm-cm)	Subsurface Oil Character							Water Table (cm)	Sheen Color B,R,S,N	Clean Below Yes / No		
			MS	LB	UB	OB			AP	OP	PP	OR	OF	TR	NO				%	
A-1	113	M / M		✓			15	-								✓		-	-	-
C-1	117	M / M		✓			10	-								✓		-	-	-
		/						-												
		/						-												

8. COMMENTS: Cleanup Recommendations; Ecological/Recreational/Cultural Issues; Wildlife Observations; Oiling Descriptions

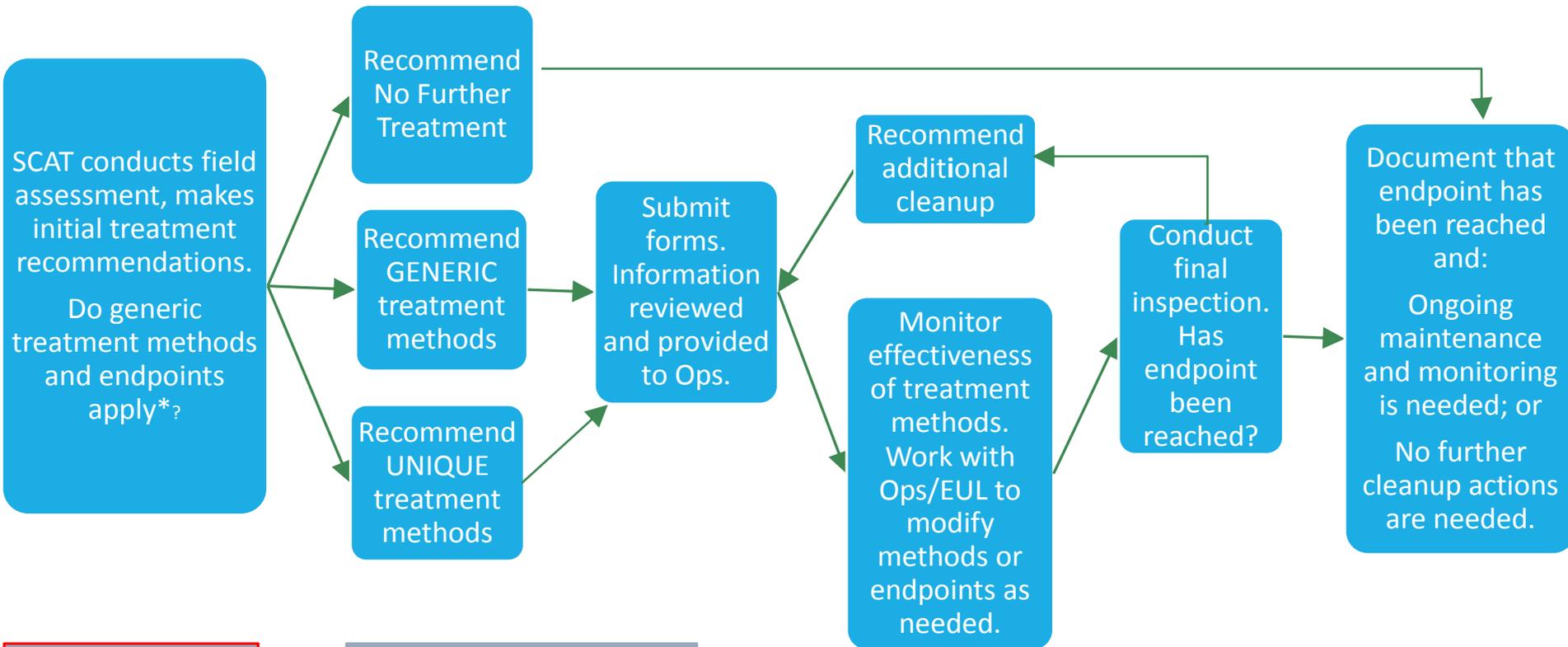
FLUSH - LOW PRESSURE FROM BOATS IN ZONES A & C - AVOID SEDIMENT EROSION.
 ZONE B - USE SORBENTS TO RECOVER FLOATING OIL IN ROOT BALLS THEN
 PUSH UNTIL NO FREE BLACK OIL MOBILIZED.

Sketch (Map) Yes / No Photos/Video Yes / No Numbers: (14 - 30) Photographer Name: SMITH

Zone B: WP 114-115
100% TO 8 x 1 m



SCAT TEAM ACTIONS



Shoreline Oiling Summary (SOS) for Assessment

Shoreline Treatment Recommendation (STR)

Shoreline Inspection Report (SIR)



* Generic Treatments and Endpoints provided in SCAT Workplan.

